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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/824,658	04/15/2004	Joseph Hess	NOVAP0012	7721
24203	7590	03/15/2006	EXAMINER	
GRIFFIN & SZIPL, PC SUITE PH-1 2300 NINTH STREET, SOUTH ARLINGTON, VA 22204			MARTIN, LAURA E	
			ART UNIT	PAPER NUMBER
			2853	

DATE MAILED: 03/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	Application No. 10/824,658	Applicant(s) HESS ET AL.	
	Examiner Laura E. Martin	Art Unit 2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 April 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 August 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>4/15/04</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Claim Objections***

Claims 3 and 4 are objected to based on the number of nozzles in a membrane section of  $500\text{ }\mu\text{m}^2$ . In the specification, it states that a fluid with a high density, such as 7 cps, requires a nozzle of a larger diameter, such as  $17\text{ }\mu\text{m}$ . With such calculations, it does not seem likely to have such high numbers of nozzles in such a small area. Examiner requests more detailed explanation.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

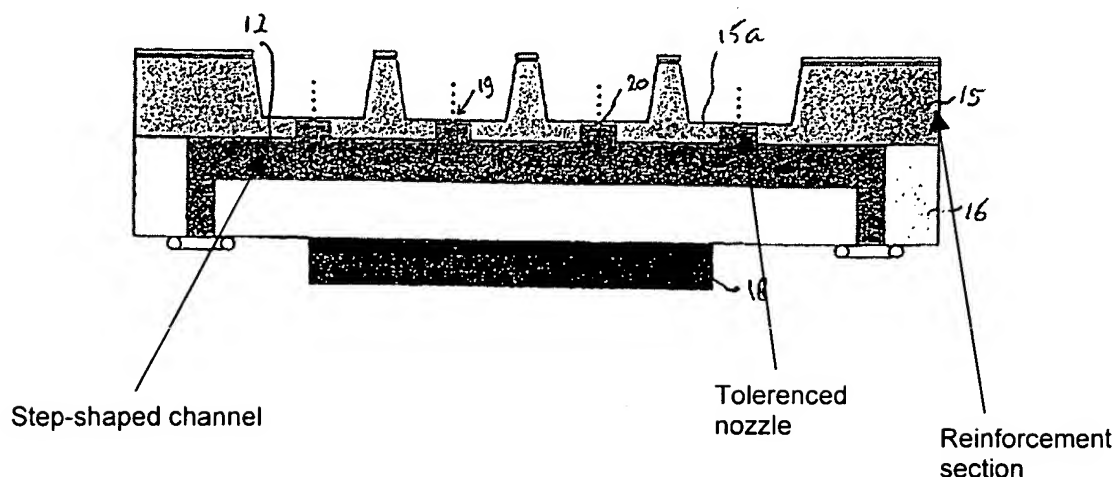
Claims 1 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Hess et al. (EP 1273355).

As per claim 1, Hess et al. teaches a nozzle body for a liquid droplet (figures 3a, 3b, and 3c) comprising: a first substrate in which a space is formed (figure 3a, element 16), a second substrate having at least one nozzle membrane section (figure 3a, element 15) and reinforcement section (figure 3a, element 15), wherein said first and second substrates are arranged such to enclose the space [0027], wherein each of said nozzle membrane sections comprises a high density array of outlet nozzles and output channels (figure 3a, element 20) that connect said enclosed space with each of said

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outlet nozzles, said outlet nozzles and said output channels having a tightly toleranced, straight, non-tapered shape, wherein said second substrate has a top surface in which at least one cavity is formed (figure 3a, element 15a) so as to provide the nozzle membrane section corresponding to the bottom of said cavity with surrounding reinforcement sections, and a bottom surface adjacent to and enclosing said space thus forming a chamber for containing said liquid substance [0027-0029], wherein each said nozzle output channel is step shaped [0018] with a wider portion being adjacent said space and a thinner portion containing a protrusion section protruding beyond the top surface of said nozzle membrane section of said second substrate (figure 3a, element 15) such that the exterior side wall of the protrusion section of said output channel is a substantially straight angle with respect to the top surface of said nozzle membrane section of said second substrate (figure 3a, element 12). Examiner notes that the preamble does not hold weight to the claim rejection.

Figure 3a



As per claim 9, Hess et al. teaches a liquid droplet spray device comprising a nozzle body (figure 3a) and a vibrating element disposed to vibrate liquid in said space so as to eject said liquid substance as a spray through the outlet nozzles (figure 3a, element 18; [0033]).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hess et al. (EP 1273355) in view of Silverbrook (US 666933).

Hess et al. teaches the nozzle body of claim 1; however, it does not teach the array corresponding to an array having at least 85 outlet nozzles for a nozzle membrane section of  $500 \mu\text{m}^2$ .

Silverbrook et al. teaches an array corresponding to an array having at least 85 outlet nozzles for a nozzle membrane section of  $500 \mu\text{m}^2$  (column 12, lines 24-43).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the nozzle body of Hess et al. with the disclosure of Silverbrook in order to create a higher quality printed image.

Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hess et al. (EP 1273355).

Hess et al. discloses the claimed invention except for an array having at least 169 and 300 outlet nozzles for a membrane section of  $500\text{ }\mu\text{m}^2$ . It would have been obvious to one having ordinary skill in the art at the time the invention was made to have large amounts of nozzles in order to print high definition pictures, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205, USPQ 215 (CCPA 1980).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hess et al. (EP 1273355) in view of Adachi et al. (US 20020458952).

Hess et al. teaches the nozzle body according to claim 1; however, it does not disclose the viscosity of the liquid being at least 5 mPas.

Adachi et al. teaches the viscosity of the liquid being at least 5 mPas [0073].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the nozzle body of Hess et al. with the disclosure of Adachi et al. in order to create a high quality printed image.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hess et al. (EP 1273355) in view of Koto (US 4434430).

Hess et al. teaches the nozzle body of claim 1; however, it does not disclose the first and second substrate being formed integrally from one substrate.

Koto teaches a first and second substrate being formed integrally from one substrate (column 9, lines 50-64).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the nozzle body of Hess et al. with the disclosure of Koto in order to create a high quality product using less materials.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hess et al. (EP 1273355) in view of Hartman (US 20030085966).

Hess et al. teaches the nozzle body of claim 1; however, it does not disclose a space consisting of a soft porous medium for containing the liquid substance.

Hartman discloses a space consisting of a soft porous medium for containing the liquid substance [0024].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the nozzle body of Hess et al. with the disclosure of Hartman in order to easily contain liquid within the body.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hess et al. (EP 1273355) in view of Koizumi et al. (US 5900894).

Hess et al. teaches the nozzle body of claim 1; however, it does not disclose the space consisting of at least two sub-spaces separated by a flexible but leak-tight

separation, each sub-space containing a different liquid to be ejected together through said nozzle membrane section.

Koizumi et al. teaches a space consisting of at least two sub-spaces separated by a flexible but leak-tight separation, each sub-space containing a different liquid to be ejected together through said nozzle membrane section (column 14, line 18- column15, line 10).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the nozzle body of Hess et al. with the disclosure of Koizumi et al. in order to create a higher quality nozzle chamber.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hess et al. (EP 1273355) in view of Adachi et al. (US 20030107159).

Hess et al. teaches the nozzle body of claim 1; however, it does not disclose the vibrating element is attached to the body through removable attachment means.

Adachi et al. teaches a vibrating element is attached to the body through removable attachment means [0057].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the nozzle body of Hess et al. with the disclosure of Adachi et al. in order to allow for easy replacement of damaged or non-working vibrating elements.




Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura E. Martin whose telephone number is (571) 272-2160. The examiner can normally be reached on Monday - Friday, 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Laura E. Martin

 3/6/06  
**MANISH S. SHAH**  
**PRIMARY EXAMINER**